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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 C.F.R. § 1.53(b))

Attorney Docket No.	97.20A
First Inventor or Application Identifier	SCHUMACHER
Title	CHITOSAN-STABILIZED PEANUT BUTT
Express Mail Label No.	EM348901639US

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Box Patent Application
Washington, DC 20231

1. [X] * Fee Transmittal Form *(e.g., PTO/SB/17)*
(Submit an original and a duplicate for fee processing)

2. [X] Specification [Total Pages [8]]
(preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings *(if filed)*
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. [ ] Drawing(s) *(35 U.S.C. 113)* [Total Sheets [ ]]

4. Oath or Declaration [Total Pages [ ]]
a. [X] Newly executed (original or copy)
b. [ ] Copy from a prior application (37 C.F.R. § 1.63(d))
(for continuation/divisional with Box 16 completed)
i. [ ] DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application, see 37 C.F.R. §§ 1.63(d)(2) and 1.33(b).

NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

5. [ ] Microfiche Computer Program *(Appendix)*

6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
a. [ ] Computer Readable Copy
b. [ ] Paper Copy (identical to computer copy)
c. [ ] Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. [ ] Assignment Papers (cover sheet & document(s))
8. [ ] 37 C.F.R.§3.73(b) Statement *(when there is an assignee)* [X] Power of Attorney
9. [ ] English Translation Document *(if applicable)*
10. [X] Information Disclosure Statement (IDS)/PTO-1449 [X] Copies of IDS Citations
11. [ ] Preliminary Amendment
12. [X] Return Receipt Postcard (MPEP 503)
(Should be specifically itemized)
13. [X] * Small Entity Statement(s) *(PTO/SB/09-12)* [ ] Statement filed in prior application, Status still proper and desired
14. [ ] Certified Copy of Priority Document(s)
(if foreign priority is claimed)
15. [ ] Other: .....

16. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in a preliminary amendment:*
[ ] Continuation [ ] Divisional [ ] Continuation-in-part (CIP) of prior application No: ____/____
Prior application information: Examiner ____ *Group / Art Unit:* ____

For CONTINUATION or DIVISIONAL APPS only: **The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.**

17. CORRESPONDENCE ADDRESS

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Name (Print/Type)	BRIAN J. COYNE	Registration No. (Attorney/Agent)	29,911
Signature	Brian J. Coyne	Date	06/14/99

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STATEMENT CLAIMING SMALL ENTITY STATUS (37 CFR 1.9(f) & 1.27(b))--INDEPENDENT INVENTOR	Docket Number (Optional) 97.20A

Applicant, Patentee, or Identifier: EDWARD W. SCHUMACHER

Application or Patent No.: _____

Filed or Issued: _____

Title: CHITOSAN-STABILIZED PEANUT BUTTER

As a below named inventor, I hereby state that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees to the Patent and Trademark Office described in:

- [X] the specification filed herewith with title as listed above.
- [ ] the application identified above.
- [ ] the patent identified above.

I have not assigned, granted, conveyed, or licensed, and am under no obligation under contract or law to assign, grant, convey, or license, any rights in the invention to any person who would not qualify as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern, or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- [X] No such person, concern, or organization exists.
- [ ] Each such person, concern, or organization is listed below.

Separate statements are required from each named person, concern, or organization having rights to the invention stating their status as small entities. (37 CFR 1.27)

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

EDWARD W. SCHUMACHER		
NAME OF INVENTOR	NAME OF INVENTOR	NAME OF INVENTOR
Edward W. Schumacher		
Signature of inventor	Signature of inventor	Signature of inventor
6-14-99		
Date	Date	Date

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PATENT APPLICATION

Title of Invention: Chitosan-stabilized Peanut Butter

Applicant: Schumacher, Edward W.

Applicant's Address: 1863 North "E" Street, Aberdeen, WA 98520

Applicant's Citizenship: U.S.A.

Cross Reference to Related Applications: Applicant filed a Provisional Application on June 15, 1998, Application Number 60/089,346, concerning related subject matter.

Statement Regarding Federally Sponsored Research Or Development: None

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates generally to gravitationally stabilized peanut butter, and methods for preparing the same. More particularly, the invention relates to the use of chitonase to stabilize the oily and proteinaceous phases of peanut butter.

2. Background Art

In the manufacture of peanut butter, peanuts are first removed from the outer shells, then separated from the inner hulls. The peanut kernels are then roasted at a controlled temperature and moisture removed. The roasted peanuts are thereafter ground to a paste, the paste commonly being referred to as natural peanut butter. Such natural peanut butter is not stable: on standing, the natural peanut butter separates into a clear layer of peanut oil that gradually collects on top of a proteinaceous layer. Many consumers object to natural peanut butter for this reason, since they find it inconvenient to have to mix the peanut oil into the proteinaceous layer each time they wish to consume the peanut butter. Natural peanut butter also lacks the spreadability desired by consumers.

A stabilizing technique employed in the prior art to overcome this oil separation problem has been addition of hydrogenated

peanut, soybean, cottonseed, rapeseed and/or palm oil, after the peanuts are ground, with thorough mixing. See, for example, U.S. Patent No. 5,591,477, to Boyce, et al. This would set into a firm consistency matrix that entrapped the peanut butter. Musher, U.S. Patent No. 2,131,064 disclosed a food base material that may be incorporated into peanut butter to maintain the peanut oil in suspension. The food base material comprised a heavy aqueous paste containing water-absorbent bodier and thickeners, such as pectin, and a relatively hard fat material. These stabilization techniques are subject to the objection, however, that ingestion of highly hydrogenated fats is widely regarded as presenting unacceptable risks to human health.

What is needed, therefore, and what the present invention provides, is a method to manufacture natural peanut butter that overcomes the oil separation problem and that is free from these objections. This is accomplished by mixing into the oil phase of natural peanut butter a quantity of chitosan and an edible fatty acid, blending the oil and proteinaceous phases, and adding water with stirring, as described below. Chitosan has been previously used as a food additive and in pharmaceutical preparations to reduce the absorption of lipids; see, for example, U.S. Patent No. 4,223,023 to I. Furda. See generally, Hennen, William H., Ph.D., Chitosan, Woodland Publishing, Inc. (Pleasant Grove, UT, 1996). The use of chitosan to gravitationally stabilize peanut butter appears to be new, however.

SUMMARY OF THE INVENTION

In a first aspect of the invention, a method is provided for gravitationally stabilizing natural peanut butter. To the upper, oil phase of a quantity of natural peanut butter is added, with mixing, a quantity of chitosan and an edible fatty acid. The oil phase is blended with the proteinaceous phase and a quantity of water is added to the blend, thereby gravitationally stabilizing the peanut butter such that the oil and proteinaceous phases will not separate even after prolonged standing. Preferably, chitosan is added to a final concentration of 0.5-3.0%, by weight; more

preferably, 0.7-2.0%, by weight; and most preferably 0.75-1.25%, by weight. Preferably, the edible fatty acid is chosen from one or more of oleic, linoleic, palmitic, stearic or linolenic acid. Preferably, the edible fatty acid is added to a final concentration of 0.1-0.6%, by weight; more preferably, 0.1-0.4%, by weight; and most preferably, 0.14-0.25%, by weight. Most preferably, the edible fatty acid is stearic acid. Preferably, the water is added to a final concentration of 0.2-2.0% by weight, and most preferably, about 0.5% by weight. In a second aspect of the invention, a gravitationally stabilized natural peanut butter is provided, prepared according to the described method.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

If the starting material is the peanuts themselves, natural peanut butter may be prepared by the methods well known to persons of ordinary skill in the art, comprising the steps of removing the outer shells from the peanuts; separating the peanut kernels from the inner hulls of the peanuts; roasting the peanut kernels, thereby removing moisture therefrom; and grinding the roasted peanut kernels, thereby forming a natural peanut butter paste. Alternatively, the starting material for the method of the present invention may be any of a variety of commercially available natural peanut butters, prepared substantially according to the above-recited steps.

Natural peanut butter is allowed to stand for a sufficient period of time, preferably at room temperature (about 20° C.), for the oil phase to separate from, and form a liquid layer on top of, the proteinaceous phase of the peanut butter. Typically, when the phases are fully separated, the oil phase will comprise about one-half of the entire volume of the peanut butter. Chitonase is added to the oil phase, and the oil phase is stirred. Similarly, an edible fatty acid is added to the oil phase, and the oil phase is stirred. The fatty acid is an edible straight or branched chain fatty acid, preferably oleic, linoleic, palmitic, stearic or linolenic acid, and most preferably stearic acid. The oil phase and the proteinaceous phase are then mixed and blended together,

and water is added until the mix noticeably thickens. It is suggested, without being bound, that the presence of the fatty acid and water in the mix convert the chitonase from a free amino form to a protonated-amine, cationic form of chitonase -- and that the latter is more effective in achieving gravitational stabilization of the mix.

The chitonase used is in powder form, and is most preferably made from the exoskeleton of shrimp, and treated to remove any trace of shrimp flavor by methods well known to persons of ordinary skill in the art. Chitonase is preferably added to a final concentration in the mix of 0.5-3.0%, by weight; more preferably, 0.7-2.0%, by weight; and most preferably 0.75-1.25%, by weight. The fatty acid is added to the mix to a preferable final concentration of 0.1-0.6%, by weight; more preferably, 0.1-0.4%, by weight; and most preferably, 0.14-0.25%, by weight. The amount of water that should be added will vary somewhat, depending upon the moisture content of the natural peanut butter starting material; generally, water should be added to final concentration of the added water in the amount 0.2-2.0%, by weight, and most preferably to about 0.4%, by weight.

The following example is given by way of illustration and not limitation:

Three pounds (6.6 kg.) of Golden Boy All Natural Peanut Butter, prepared by Golden Peanut Co., Atlanta, Georgia, was permitted to stand until there was complete separation of the oil and proteinaceous phases. To the oil phase was added 75 g. of chitosan derived from shrimp exoskeleton. The oil phase was stirred. To the oil phase was then added 23 g. of powdered, stearic acid. The oil phase was again stirred. The oil phase was mixed into, and blended with, the proteinaceous phase for about two minutes, using a kitchen blender. Thirty milliliters (30 g.) of water was then added to the blended mix, with stirring. The blended natural peanut butter/ chitosan mix was observed to thicken noticeably with addition of the water. Thereafter, the oil and proteinaceous phases remained fully in suspension and did not

separate. No taste of shrimp was detectable upon taste testing of the peanut butter.

Various changes and modifications will become obvious to those skilled in the art. It is the intent that these changes and modifications are to be encompassed within the spirit of the appended claims and that the invention described herein is illustrative only and not intended to limit the scope of the invention.

I claim:

1. A method for gravitationally stabilizing peanut butter, comprising:

(a) allowing the peanut butter to stand for sufficient time for an oil phase to separate out from, and form on top of, a proteinaceous phase;

(b) adding chitonase to the oil phase;

(c) adding an edible fatty acid to the oil phase;

(d) stirring the oil phase;

(e) mixing and blending the oil phase with the proteinaceous phase to form a peanut butter/chitonase/fatty acid blend; and

(f) adding water, with stirring, to said blend until noticeable thickening of said blend occurs.

2. The method of claim 1, wherein the final concentration of the chitonase is 0.5-3.0%, by weight.

3. The method of claim 2, wherein the edible fatty acid is selected from one or more of oleic, linoleic, palmitic, stearic and linolenic acid.

4. The method of claim 3, wherein the final concentration of the edible fatty acid is 0.1-0.4%, by weight.

5. The method of claim 3, wherein the final concentration of the added water is 0.2-2.0%, by weight.

6. The method of claim 1, wherein the final concentration of chitonase is 0.75-1.25%, and the fatty acid is stearic acid in final concentration 0.14-0.25%, by weight.

7. The method of claim 6, wherein the added water is in final concentration about 0.4%, by weight.

8. A gravitationally stabilized, natural peanut butter blend, comprising an admixture of chitonase, a fatty acid selected from one or more of oleic, linoleic, palmitic, stearic and linolenic acid, water, and natural peanut butter.

9. The gravitationally stabilized, natural peanut butter blend of claim 8, wherein the chitonase is present in final concentration 0.5-3.0%, by weight, the fatty acid is stearic acid in final concentration 0.1-0.6%, by weight, and water is present in final

concentration 0.2-2.0%, by weight.

10. A gravitationally stabilized, natural peanut butter blend made from natural peanut butter by a method, comprising:

(a) allowing the peanut butter to stand for sufficient time for an oil phase to separate out from, and form on top of, a proteinaceous phase;

(b) adding chitonase to the oil phase;

(c) adding an edible fatty acid to the oil phase;

(d) stirring the oil phase;

(e) mixing and blending the oil phase with the proteinaceous phase to form a peanut butter/chitonase/fatty acid blend; and

(f) adding water, with stirring, to said blend until noticeable thickening of said blend occurs.

11. The gravitationally stabilized peanut butter blend of claim 10, wherein the chitonase is present in final concentration 0.5-3.0%, by weight, the fatty acid is stearic acid in final concentration 0.1-0.6%, by weight, and water is present in final concentration 0.2-2.0%, by weight.

12. The gravitationally stabilized peanut butter blend of claim 10, wherein the chitonase is present in final concentration 0.75-1.25%, by weight, the edible fatty acid stearic acid present in final concentration 0.14-0.25%, by weight, and the added water is present in final concentration of about 0.4%, by weight.

ABSTRACT OF THE SPECIFICATION

A natural peanut butter blend gravitationally stabilized with chitonase to prevent separation of the oil and proteinaceous phases. The blend is prepared by adding chitonase and a fatty acid, preferably stearic acid, to the oil phase, blending the oil and proteinaceous phases, and then adding water until the blend noticeably thickens.

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☒ Declaration Submitted with Initial Filing OR ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	97.20A
First Named Inventor	SCHUMACHER
COMPLETE IF KNOWN	
Application Number	/
Filing Date	
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

CHITOSAN-STABILIZED PEANUT BUTTER

(Title of the Invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) [ ] as United States Application Number or PCT International Application Number [ ] and was amended on (MM/DD/YYYY) [ ] (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	
60/089,346	06/15/98	☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number *(if applicable)*

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As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: ☐ Customer Number → *Place Customer Number Bar Code Label here*

OR

☒ Registered practitioner(s) name/registration number listed below

Name	Registration Number	Name	Registration Number
BRIAN J. COYNE	29,911		

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

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Name	BRIAN J. COYNE				
Address	905 - 24TH WAY SW, STE. B#3				
Address					
City	OLYMPIA	State	WA	ZIP	98502
Country		Telephone	943-7713	Fax	943-9401

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Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned inventor

Given Name (first and middle [if any])	Family Name or Surname
EDWARD W.	SCHUMACHER

Inventor's Signature	Edward W. Schumacher					Date	6-14-99
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Post Office Address							
City	Aberdeen	State	Wa.	ZIP	98520	Country	U.S.A.

☐ Additional inventors are being named on the ___ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto